

What is claimed is:

1. A surgical tether for orthopedic treatment to secure to two adjacent bone portions,

said tether comprising:

5 a cord having a tensile strength sufficient to maintain a desired distance or orientation of
the two bone portions;

a first sheath substantially encasing the cord, said first sheath comprising a plurality of
fibers and providing an abrasion resistant coating to the cord;

a radiopaque element; and

10 optionally, a second sheath, said second sheath substantially encasing the first sheath.

2. The tether of claim 1 wherein the cord is slidably received within the second outer
cord.

15 3. The tether of claim 1 wherein the cord is elongate and defines a longitudinal axis
and wherein the cord is free to move longitudinally with respect to the first sheath.

4. The tether of claim 1 wherein the first and second sheaths are frictionally engaged
with each other.

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5. The tether of claim 1 wherein the cord consists of a single fiber.

6. The tether of claim 1 wherein the cord comprises a plurality of fibers.

7. The tether of claim 6 wherein the plurality of fibers are braided to provide the cord.

5 8. The tether of claim 7 wherein the radiopaque element comprises a single radiopaque filament woven in the plurality of fibers.

10 19. The tether of claim 1 wherein the plurality of fibers are braided to provide the first sheath.

10 10. The tether of claim 1 wherein the radiopaque element comprises barium sulfate.

15 11. The tether of claim 1 wherein the first sheath comprises a radiopaque element.

15 12. The tether of claim 1 wherein the radiopaque element comprises a single radiopaque filament woven in the plurality of filaments.

20 13. The tether of claim 1 wherein the radiopaque element comprises a plurality of radiopaque filaments.

14. The tether of claim 1 wherein the radiopaque element comprises one or more radiopaque filaments spirally wound around the first or first sheath.

15. The spinal tether of claim 1 comprising the optional second sheath substantially encasing the first sheath wherein second sheath is not fixedly secured to either the cord or the first sheath.

5 16. The tether of claim 15 wherein the second sheath comprises a plurality of braided fibers.

17. The tether of claim 15 wherein the radiopaque fiber is embedded within the second sheath.

10 18. The tether of claim 1 wherein cord is elongate and defines a longitudinal direction and the second sheath is free move longitudinally with respect to the first sheath or the cord.

15 19. The tether of claim 1 wherein the tether is attached to a plurality of bone portions.

20. The tether of claim 1 wherein the cord or the first sheath or both are composed of an elastomeric material.

21. The tether of claim 1 wherein the two bone portions include a first and second vertebrae.

22. The tether of claim 1 wherein the two bone portions include an articulating joint.

23. The tether of claim 1 wherein the cord and the first sheath are flexible.

24. The tether of claim 1 wherein the cord is composed of a polymeric material selected from the group consisting of: polyethylene, ultra high molecular weight polyethylene, 5 polypropylene, fluoropolymers, polytetrafluoroethylene, polyamides, polyethylene terephthalate, polyesters, polyaramid, silicon rubbers, polyurethane, polyvinylchloride.

25. The tether of claim 24 wherein the first sheath is composed of a material different from the cord.

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26. The tether of claim 25 wherein the first sheath is composed of a material selected from the group consisting of: polyethylene, polypropylene, fluoropolymers, polytetrafluoroethylene, polyamides, polyethylene terephthalate, polyesters, polyaramid, silicon rubbers, polyurethane, polyvinylchloride.

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27. The tether of claim 1 wherein the cord and first sheath are composed of a biodegradable material.

20 28. The tether of claim 1 wherein the cord and first sheath are composed of a non- biodegradable material.

29. The tether of claim 1 comprising a first bone fastener and a second bone fastener to secure the tether to the two bone portions.

30. The tether of claim 29 wherein the first and second bone fasteners secure the cord to the first and second bone portions.

5 31. The tether of claim 30 wherein the first sheath is not secured to the two bone portions.

32. The tether of claim 30 comprising the second sheath and wherein the second sheath is not secured to the two or more bone portions.

10 33. The tether of claim 1 wherein the radiopaque element is composed of a biocompatible metallic fiber.

34. The tether of claim 33 wherein the radiopaque element is composed of a material selected from the group consisting of: nitinol, titanium, titanium-vanadium-aluminum alloy, cobalt-chromium alloy, cobalt-chromium-molybdenum alloy, cobalt-nickel-chromium-molybdenum alloy, stainless steel, tantalum, niobium, hafnium, tungsten, gold, silver, platinum, and iridium metals, alloys, and mixtures thereof.

20 35. The tether of claim 1 wherein the radiopaque element exhibits an effective duration *in vivo* of between about one month and about 5 years.

36. A surgical tether for orthopedic treatment to secure to two adjacent bone portions, said tether comprising:

a cord having a tensile strength sufficient to maintain a desired distance or orientation of the two bone portions;

5 a first sheath substantially encasing the cord, said first sheath comprising a plurality of fibers and providing an abrasion resistant coating to the cord; and
means for imparting radiolucency to the tether.

37. A surgical tether for orthopedic treatment to secure adjacent bone portions, said
10 tether comprising:

a cord having a tensile strength sufficient to maintain a desired distance or orientation of the bone portions;

a first sheath substantially encasing the cord, said first sheath comprising a plurality of fibers;

15 a radiopaque filament engaged with either the cord or the first sheath; and
means for attaching the first sheath to the cord to provide an abrasion resistant coating to the cord.

38. A method for treating an orthopedic defect, said method comprising:
securing a tether to a first bone portion, said tether comprising a cord, a first
sheath substantially encasing the cord, and a radiopaque element, wherein the cord and the first
sheath are free to move longitudinally relative to each other; and
5 attaching the cord to a second bone portion to secure the first bone portion and the
second bone portion at a desired distance or orientation relative to each other.

39. The method of claim 38 wherein said securing comprises securing the cord to the
first bone portion.

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40. The method of claim 38 wherein the tether comprises a second sheath.

41. The method of claim 38 wherein the radiopaque element comprises a radiopaque
fiber attached to the second sheath.

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42. The method of claim 38 wherein the radiopaque element comprises a radiopaque
fiber attached to either the first or second sheath.

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43. The method of claim 38 wherein the radiopaque element comprises a radiopaque
fiber attached to the cord.

44. The method of claim 38 wherein the radiopaque element comprises a radiopaque
fiber attached to the first sheath.

45. The method of claim 38 comprising positioning the first and second bone portions into a desired orientation or in close proximity to each other.

5 46. The method of claim 38 wherein the first and second bone portions are first and second vertebrae.

47. The method of claim 38 wherein the first and second bone portions each comprise a long bone.

10 48. The method of claim 38 wherein the first and second bone portions comprise an articulating joint.

15 49. The method of claim 38 wherein the tether is composed of one or more biodegradable materials.

50. The method of claim 38 wherein the tether is composed of a non-biodegradable material.

20 51. The method of claim 38 wherein the cord is composed of a material different from the first sheath.

52. The method of claim 38 wherein the cord is composed of a material selected from the group consisting of: polyethylene, ultra high molecular weight polyethylene, polypropylene, fluoropolymers, polytetrafluoroethylene, polyamides, polyethylene terephthalate, polyesters, polyaramid, silicon rubbers, polyurethane, polyvinylchloride.

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53. The method of claim 38 wherein the first sheath is composed of a material selected from the group consisting of: polyethylene, ultra high molecular weight polyethylene, polypropylene, fluoropolymers, polytetrafluoroethylene, polyamides, polyethylene terephthalate, polyesters, polyaramid, silicon rubbers, polyurethane, polyvinylchloride.

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54. The method of claim 38 wherein the radiopaque element is composed of a biocompatible metal fiber.

15 55. The method of claim 38 wherein the biocompatible metal fiber is selected from the group consisting of: nitinol, titanium, titanium-vanadium-aluminum alloy, cobalt-chromium alloy, cobalt-chromium-molybdenum alloy, cobalt-nickel-chromium-molybdenum alloy, stainless steel, tantalum, niobium, hafnium, tungsten, gold, silver, platinum, barium sulfate, and iridium metals, alloys, and mixtures thereof.

20 56. The method claim 38 wherein the tether is secured to more than two bone portions.

57. The method of claim 38 comprising cutting the tether to a desired length.

58. The method of claim 57 comprising heat sealing the cut ends of the tether.